FISKE FUND PRIZE ESSAY.

ART. IX.—*Does Pregnancy accelerate or retard the Development of Tubercles of the Lungs in persons predisposed to this Disease?* By EDWARD WARREN, M. D., of Edenton, North Carolina. The Dissertation to which the Fiske Fund Prize was awarded, June 4, 1856.[1] (Published by request of the Rhode Island Medical Society.)

CHAP. I. § 1.—"Similia, similibus curantur," is the maxim of Hahnemann and his followers. "Contraria contrariis curantur" is the doctrine of Hippocrates and of those who recognize him as their leader. According to the teachings of one, two affections of a like nature cannot exist at the same time in the organism; and the most effectual method of destroying a *spontaneous* morbid condition, is to superinduce an *artificial* state of a similar character. The other affirms, that dissimilar conditions only are incompatible, and that disease is relieved most completely and certainly by developing in the system a state opposite and antagonistic to that already existing. Homœopathy bases its theories upon the doctrine of "similitudes:" Allopathy finds the "fons et origo" of its principles in the great law of "antagonism" which is impressed on all morbid phenomena.

If the utter falsity of this doctrine of "similitudes" were not acknowledged by a vast majority of scientific men, whose daily experience but confirms their logical deductions respecting its real character, it might be important, in this connection, to adduce the testimony of the ablest advocates of Homœopathy in proof of the impracticability of the system, and to demonstrate the contradictions and inconsistencies of its fundamental principles.

But these false doctrines have already reached the climax of their glory; the world begins to realize that it has been deluded long enough by the maxims of this mistaken philosophy; the period for discussion has gone by, and it is only necessary to make a plain statement of the whole matter, and then to leave it to the common sense of mankind, in order to secure the complete overthrow of this pernicious system.

At Leipsic, which has been the head-quarters of Homœopathy, the only hospital devoted to that system contains but six beds, and all of these are

[1] The Trustees of the Fiske Fund, at the annual meeting of the Rhode Island Medical Society, held at Providence, June 4, 1856, announced that they had awarded to the author of the dissertation bearing the motto—

"*Qui fugit molam, farinam non invenit,*"

The premium of one hundred dollars, by them offered for the best dissertation on the following subject, viz: "*Does Pregnancy accelerate or retard the Development of Tubercles of the Lungs in persons predisposed to this Disease?*"

Upon breaking the seal of the accompanying packet, they ascertained its author to be Edward Warren, M. D., of Edenton, North Carolina.

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not usually occupied. In Paris, M. Andral put it to the test of experience in one of the general hospitals, and the result was a total failure. He treated one hundred and forty patients in the presence of the homœopathists themselves, adopting every requisite care and precaution, and yet in not one instance was he successful. In Russia, the Grand Duke Michael invested a German homœopathist with full powers to test its merits, and in two months the experiment was pronounced unsatisfactory by the government, and discontinued. In Naples, a trial was made by the royal order, by which it was established, not only that homœopathic treatment produced no effect on disease, but that it was positively injurious—for the reason, that it prevented the employment of remedies by which the patients might have been cured. In London, there are, at present, but two homœopathic hospitals, one of which is about closing for want of funds, and the other is in a declining state. Thus has the system of Hahnemann proved a failure when tested practically, and is now everywhere on the decline.

Theoretically, it has not been more successful, as must be admitted by every unprejudiced mind. The homœopathists have failed to demonstrate either that medicinal powers do produce an artificial malady, similar to the natural affection; that the organism only remains under the influence of the medicinal disease; that the artificial disease is of short duration, or that all the effects can only be produced by selecting an agent which produces results similar to the symptoms; and hence, their doctrines have not only been impugned by Rau, Shroen, and Griesselich, but repudiated as illogical and visionary by the most intelligent observers throughout the world.

The doctrine of Hippocrates has its foundation in reason—embodies the plain, practical, and logical view of the subject, and is sustained by the experience of a vast majority of the most scientific men in every country. Upon it has been reared the superstructure of modern medicine; and to it belongs the glory of nearly all the triumphs which have marked the progress of the healing art from the days of its founder, down to the present time. The principle, that "like causes produce like effects," and the proposition which stands in correlation to it, are recognized in every department of science, and by all classes of observers. So universal is the acceptation of the truths thus imbodied, that they have become axioms in themselves, and the tests whereby the merits of any system may be determined. Homœopathy rejects these propositions—repudiates the principles involved in them, and assumes that Nature, in her therapeutical operations, acts upon another and an entirely contradictory plan. Their explanations of the great processes now under consideration, would lead them, if strictly adhered to in the practice of medicine, to increase the congestion of the brain in apoplexy; to accelerate the circulation in fever; to restrain hepatic action in torpor of the liver; and to induce a condition of debility, stagnation, and impoverishment in the systems of those predisposed to phthisis—which would be as reasonable as for the sailor to attempt to lighten his ship by adding to her cargo, or for the engineer to relieve the strain upon the boiler of his engine, by the constant generation of steam. This system, to be true, must make the axioms alluded to, false; and as the idea of falsity is utterly precluded by the *very definition of the term*, it follows that homœopathy is illogical in its fundamental principles. Disease can be nothing more than a manifestation of certain phenomena, which depend upon the existence of some principle, different in its essence and operation from that agency by which the organism is maintained in its normal state. It consists in the presence of a series of effects, which are the results of the action of a particular cause. This *cause* operates, and

these *effects* are produced in consequence of some alteration of the natural condition of the system, whereby a state is developed favorable to the action of the one, and the manifestation of the other. Hence, we have three elements essential to disease:—

1. An *altered condition*, resulting from the operation of some *general influence* or *cause*, unlike the *normal* or *healthy condition* and favorable to the action of a *particular cause*.

2. A cause distinct alike in its intrinsic character, and in its ultimate effects, and operating in a peculiar manner.

3. Effects, or symptoms, which take their character from the peculiar agent which has called them into existence, and from the manner of its action.

In some affections, as those which are contagious and infectious, this *general* and this *immediate cause* are combined, or so intimately associated, that they cannot be distinguished; whilst in the remainder, such as typhoid fever, phthisis, &c., they are not only separated, but easily recognized and cognizable. Now, it is manifest that the first step towards recovery, consists in an alteration of that original morbid condition, by which the *particular cause* has been enabled to operate in the production of its legitimate effects or symptoms, and hence it becomes a matter of the greatest importance to effect that change promptly and effectually. The continued action of this *particular cause*, or a similar one, implies a continuance of the same *original condition*—whilst the operation of a dissimilar agent, demands the existence of a different state, and demonstrates that it has been superinduced. But effects or symptoms are the only means whereby causes make themselves known, and consequently, it is only when these phenomena are unlike those which presented themselves in the first instance that any positive evidence is afforded of the commencement of the curative process. Thus it becomes evident, not only that the doctrines of Hahnemann are intrinsically false, but that the principles of Hippocrates are logically correct and entirely consistent with the laws of Nature.

Whatever *cause*, then, has a tendency to the production of a certain set of phenomena, is opposed, resisted, or restrained by that agent which produces dissimilar results, and hence the manifestation of these opposite effects or symptoms, is an evidence that an antagonism has been produced and that the curative process is in operation.

Having thus considered the nature of the law of antagonism as enunciated by the oracle of Cos, and demonstrated its logical truth and practical applicability, I shall proceed to examine into the nature of phthisis, for the purpose of showing that pregnancy develops in the system a condition directly antagonistic to that state which favours and accelerates the deposition of tubercles.

This investigation necessarily divides itself into three heads, thus:—

1. A consideration of the tubercular diathesis.
2. An inquiry into the nature of tubercle.
3. An application of the rules respecting disease already established.

Whatever differences of opinion may exist in regard to the real nature of tubercle, all, at the present day, agree that it is preceded by a general morbid condition of a peculiar character. This condition has been denominated "tubercular cachexia," by which is implied the existence of certain abnormal symptoms, indicative of an unhealthy state of the economy, and a predisposition to the deposition of tubercles in the lungs. This diathesis connects itself both with the general system and the organ in which the deposit is made, and hence it is important to examine it in its twofold relations.

1. *As regards the System at Large.*[1]—The ultimate construction of tissues consists in minute cell-formations and cell-germs, which are capable of reproduction so long as they are supplied by the blood with certain organizable materials. In the normal state there is a constant disintegration and reproduction of these cells, and an equable and reciprocal balance between the processes by which they are performed, which constitutes health in the economy. When the supply of pabulum is diminished in quantity or altered in quality, this natural equilibrium is destroyed, and disease results as a necessary and natural consequence. The plasma of the blood is the organizable pabulum which plays this important part in the economy, and hence the circulating fluid becomes the source of formative supply or deficiency to the cell-germs and the means whereby structural degeneration or healthy action is secured. When blood possesses its natural elements in their normal ratio and proper character, the conditions essential to health are complied with, and all morbid action is necessarily precluded. On the other hand, when changes have taken place in the blood, by which its various constituents are reduced below the normal standard, either completely, partially, or in quality, then the function of assimilation is interrupted, and a condition of disease develops itself in the system. The blood is supplied to the body through the agency of nutrition, and when that function is properly performed, the circulating fluid is rich in formative material, the tissues receive their due supply of organizable pabulum, and the normal state of the organism is maintained intact. But if this process is interfered with, the sanguiferous constituents are not produced in their equable and natural relation, the fibrinous plasma ceases to be properly elaborated, the red globules decrease in quantity, the albuminous element becomes excessive, and a condition of disease is developed throughout the economy.

To understand the manner in which the function of nutrition is interfered with, it is necessary to refer to the successive changes which characterize that process under ordinary circumstances. They are the following:—

1. The receipt of organic matter in the stomach.[2]
2. The transformation of this matter into albuminous and oily compounds.
3. The absorption of these by the mucous membrane, and their union into elementary nuclei and cells.
4. The transformation of these, first, into chyle corpuscles, and secondly, into blood.
5. The abstraction of the tissues of these materials which are essential to their nutrition.

Now, it is evident that as all these successive steps are essential to a proper performance of the function of nutrition, an interruption of either will interfere with all those changes which succeed it, and thus derange the whole process. In order to ascertain where the interruption has commenced, when any derangement exists, it is necessary to begin with the last effect produced, and to trace the morbid action through each successive step, until that one has been reached wherein the primary departure from the normal standard originated. In this tubercular diathesis the blood is so altered in quality that it fails to present to the tissues the organizable element which is their pabulum, and hence enervation, emaciation, and derangement of function are the symptoms which characterize this peculiar cachexia. Of all the tissues of the body, that which is composed of fat-globules, and known as the adipose, suffers most, and

[1] See Valentin, Berlin, 1834; also, Wagner, Leipsic, 1839; Shwann, Berlin, 1839; Schleiden, Paget, Meckel, Gairdner, and others.

[2] Dr. Archison, Berlin.

disappears with the greatest rapidity. This fact accounts for the extreme meagreness of phthisical patients, and clearly indicates such a derangement of the function by which fatty elements are produced, as really amounts to its complete suspension. We are thus carried back to that step in the process of nutrition by which chyle is formed, and therein discover certain abnormal changes, which, whether they depend upon any alteration or defect in the chemical and physical actions by which they are preceded, or on some other cause, are amply sufficient in themselves to account for the deterioration of the circulating fluid, and to explain all the phenomena which accompany and distinguish the tubercular cachexia. The experiments of Tiedeman and Magendie, as well as the chemical deductions of Prout and Liebig, clearly demonstrate that a proper admixture of albuminous and oleaginous elements is essential to healthy nutrition; and if healthy chyle be examined, these two principles—fat and albumen—will be found to constitute its essential elements; so that any influence which prevents the existence of either, or the proper admixture of both, impoverishes that fluid itself, and, as a consequence, produces a deterioration of the blood which is formed from it. As the globules of fat cannot enter into the system without being altered, and as an examination of the liquid found in the lacteals discloses the fact that the oleaginous elements have been reduced to a state of infinite division, it becomes evident that this alteration in their character is essential to healthy nutrition, and that there is some organ whose normal function it is to bring fatty materials into this state of emulsion. To M. Bernard belongs the credit of having discovered the manner and means of this transformation. He forced a rabbit to eat nothing but meat, and then, having opened the abdomen, he discovered that the absorbent vessels of the small intestines contained a limpid fluid for the distance of twelve inches below the pylorus, and that from that point they were white, and contained the same fluid as that which is found in the lacteals of the human subject, and in the dog throughout the whole extent of the duodenum. From this fact, and the additional reasons that in man the ducts of the liver and pancreas enter the duodenum together, near the inferior extremity of the stomach, and that in the dog one of the ducts of the latter organ empties with the duct coming from the former, M. Bernard concluded that it was the secretion from the pancreas that made the milky fluid which presented itself in the lacteals, and which depended upon the reduction of fat-globules to a state of emulsion for its peculiar appearance. As a means of testing the truth of this inference, he mixed pure pancreatic juice with oil, butter, tallow, and many different varieties of fat, and ascertained that it formed an emulsion with them all, resembling in every respect the chyle extracted from the mesenteric lacteals, and capable of *retaining its peculiar character for an indefinite period.* He then tried bile, saliva, gastric juice, serum, and the cephalo rachidian fluid, without producing any other effect upon oleaginous matter than the formation of a mechanical mixture, *which returned to its original state* in a few moments. In addition to these external experiments, he made others upon the internal organs, by which his first conclusions are positively substantiated. They are thus described by Dr. Donaldson :[1]—

"After keeping a rabbit fasting for some time, he gave it a full dose of twenty grammes of fat, and, allowing sufficient time for it to be pushed down in the intestine, he killed the animal in three hours, and found the absorbents nearly empty to the point of insertion of the pancreatic duct, whereas below that they were distended with white chyle. In the intestinal canal, above the duct of the pancreas, there was some melted fat which was unaltered in colour, but below

[1] American Journal of the Medical Sciences, 1851.

it was seen white emulsion, corresponding to that contained in the lacteals. His next essay was in tying the pancreatic duct of another animal of the same species before giving the oil, and, on opening the abdomen after the same lapse of time, he found the lacteals free from chyle, and the oily matters undigested in the intestinal tube passing down to be thrown off in the excrement. On putting a ligature around both the pancreatic ducts of a dog, he had the same result."

From the facts thus clearly established, he drew the inevitable conclusion that "the *digestion* of fatty matters was the peculiar office of the pancreas." This deduction has also been substantiated by the observations of Barreswil, Colin, Lassaigne, Dumas, and others, and is now generally received and admitted by the medical profession.

In tubercular cachexia, this digestion of fatty matter is prevented, and hence, the demand upon the tissues for the oleaginous materials deposited in them, and the general emaciation which immediately results to the patient. An interference with that process by which fat is emulsionized and made assimilable, must depend upon some alteration in the pancreatic fluid, or derangement of the organs by which it is secreted. Bennett believes that this result is due to some vitiation of the fluid, and explains the phenomenon in the following manner: "The peculiarity of phthisis however, is, that an excess of *acidity* exists in the alimentary canal, whereby the albuminous constituents of the food are rendered easily soluble, whilst the *alkaline* secretions of the saliva and pancreatic juice are more than neutralized and rendered incapable either of transforming the carbonaceous constituents of vegetable food into oil, or of so preparing fatty matters introduced into the system as will render them easily assimilable." That this *acidity*[1] exists can be easily established, either by appealing to authorities or referring to the experience of every practitioner of medicine, and that it increases the solubility of the albuminous constituents, is perfectly evident; but its effect upon the pancreatic fluid is involved in much doubt and difficulty.

If this development of acid were the first link in the chain of morbid phenomena, nothing would be easier than to counteract it by the employment of appropriate neutralizing remedies. By the use of proper alkaline agents, this condition of acidity—by which the function of the pancreas and the process of healthy nutrition are arrested—could be easily destroyed, and the tubercular diathesis removed without difficulty or delay. It is well known, however, that no morbid state is more obstinate or persistent, than that which is characterized by a disposition to the formation of tubercles in the pulmonary parenchyma, and that the only treatment from which a successful result may be anticipated in this cachexia, consists in the constant employment of appropriate tonics in connection with certain general remedies. This is an important fact, as will be demonstrated in another part of this paper, because it indicates that the source of the disorder can be traced to the nerves, and associated with the vital forces of the economy.

Again—if the improper digestion of oleaginous elements depends upon the alteration effected in the pancreatic fluid, in consequence of the development of this excessive acidity, then the employment of substances rich in acidulous constituents, would predispose to this particular diathesis. An indication would thus present itself in the treatment of phthisical predisposition, which would demand the constant abstinence from those alimentary elements which contain acids, and the avoidance of acids as remedies under every circumstance which connects itself with this particular cachexia. This would involve us in the absurdity of attempting to prevent the invasion of

[1] Clark, Williams, Wood, and others.

phthisis by the development of the circumstances most favourable to the existence of scorbutus, and the rejection of remedies standing pre-eminently forth in the list of *tonics*, which are universally admitted to be most useful agents in the management of the tubercular diathesis. If the above explanation be correct, it would follow as a matter of course, that with those persons who habitually use a large quantity of food, rich in acidulous elements, phthisis would present itself most frequently; and hence, in the tropics, where fruits are constantly ingested, cases of this affection would be most numerous—whilst the very opposite of this is true, as is universally admitted. Emaciation does not necessarily ensue where there is excessive acidity, for Trousseau has long since reported and explained many cases of dyspepsia in which this feature was particularly prominent, whilst the fatty tissues remained intact, and a plethoric condition of the system was maintained. It is well known also that many persons suffer habitually from an inordinate development of acidity, without being materially affected in their general health, and manifesting any waste of tissue or diminution of rotundity.

The idea of the necessity for the preservation of alkalinity in the pancreatic fluid, is not original with Bennett. M. Mialhe[1] maintained that alkalies are the great solvents in the animal system, and that their presence in the secretion of the pancreas, is the cause of the formation of that emulsion, whereby fatty matters are made digestible. M. Bernard, however, has conclusively demonstrated that the explanation is utterly false, and the question of its paternity is consequently rendered an unimportant one. In the first place, he showed that the natural acidity of the mucus would be sufficient to change the reaction of the juice as it issues from the pancreatic duct; and in the second, he proved that the *fluid acts even in the acid mixture*, which of course settles the question immediately and definitely. It follows, then, from these considerations, that the improper digestion of the oleaginous elements of the food does not depend upon an alteration in the pancreatic fluid, after it has been secreted, and that Bennett is entirely mistaken in his explanation of the phenomena. If the fluid be not in fault in this manner, then the pancreas must be the source (intestinal) from whence originate these influences, which so materially interfere with and modify the digestive process. They must either *produce* an altered and unhealthy fluid or secrete the natural one in a diminished and insufficient quantity. Either supposition will account for the condition of things which results in the intestine, and to the system at large, and it is unnecessary in this connection to attempt to determine which explanation is the correct one. It is manifest that there is some defect in the secreting powers of the organ, by which a proper performance of its functions is prevented, and from which all the morbid phenomena originate. This organic difficulty must depend, either upon some local cause, as inflammation, congestion of its substance, or some general one connecting itself with that nervous influence distributed to it, by which its normal actions are directed or controlled. The symptoms which distinguish the operation of the first series of causes, are described by all writers on pathology, and can be easily distinguished by every observer. As these do not exist, and as post-mortem examinations fail to discover those organic lesions which are indicative of inflammation, congestion, &c., it follows necessarily that the derangement in question results from the action of the general cause alluded to above.

The influence of the nervous system on the secreting powers of the various

[1] Mémoire sur la Digestion et l'Assimilation des matières albuminoides, &c., 1847.

organs, has long been maintained by pathologists, but it was reserved for the learned and laborious Bernard to explain and demonstrate it fully. By a series of most ingenious and convincing experiments, he has eliminated the nature of the offices imposed on the various classes of nerves, and showed conclusively, that the trophic system controls and presides over secretion. He traced out the particular nerve distributed to different organs, and succeeded in promoting and arresting the production of the fluids appertaining to each gland, by alternately increasing and diminishing the amount of nervous force with which it is supplied. From these experiments, and on account of the reasons mentioned above, it is fair to conclude, that the improper digestion of oleaginous elements, upon which emaciation depends in the tubercular cachexy, results from the fact, that the normal amount of nervous force is not conveyed to the pancreas; and hence, it is evident that the primary lesion connected with phthisis, is to be found, not in the digestive apparatus itself, but in the nervous system which presides over it. This view of the subject is not only the one which best explains the phenomena characteristic of the tubercular cachexy, but is sustained alike by an examination of the causes which induce this particular diathesis, and a reference to the remedies essential to its relief.

The causes of phthisis may properly be divided into two classes: (1.) General Causes. (2.) Special Causes.

(1.) *General Causes.*—Among the most prominent of these is hereditary predisposition. Since Hippocrates declared "Ex tabido tabidus," all writers, with two exceptions, have repeated, that consumption is hereditary. Louis contends that phthisis is not ordinarily inherited, and Pierry affirms in his second work, that it is only so in one case out of ten. It is no longer believed that the disease transmits itself by means of a particular virus, as was once supposed, but its reproduction is attributed to the development in the child of the same qualities, mental and physical, as those which distinguished its parents. It is evident that a predisposition which depends upon the existence of a *mental quality*, must connect itself with some abnormal condition of the nervous system; since it is only through the medium of the nervous mass, that mind manifests itself in its varied and multitudinous relations. The very fact that phthisis is an hereditary affection, is *prima facie* evidence, that its origin can be traced to the nerves; for it is notorious that those diseases which are caused by interruptions in the transmission of nervous force, or an improper development in the great generating centres, are more generally inherited than those involving other tissues of the body, or resulting from the operation of different influences in the economy. Thus, insanity descends from sire to son through many generations—whilst convulsions, epilepsy, hysteria, chorea, and various other affections of the nervous system are the fatal heirlooms in many families.

The constant use of improper aliments also occupies a conspicuous place in the catalogue of causes whereby consumption is produced. Now it is evident, if, when they are originally taken in the stomach, a condition of health exists which secures their proper digestion and assimilation, the amount of nutritious matter contained in them would be appropriated by the tissues, and, although emaciation and enervation would result, they could only indicate the fact that assimilable elements had not been ingested in sufficient quantity. Until a specific derangement in the digestive process is effected, the tubercular cachexia cannot exist, and it is only because of the induction of a distinct morbid alteration in the system that this peculiar diathesis is developed. The various tissues of the body require the constant supply of an

organizable material of a certain quality in a definite quantity, and without this supply, a change is effected in their organic character, and an alteration occurs in their manner of executing the particular function for which they are designed. Nervous tissue is distinguished not only by its intrinsic delicacy of structure and excessive sensibility, but also for the importance of its functions and the variety of its relations; and when the material habitually consumed is bad in quality, and diminished in quantity, it, as a matter of necessity, first feels and manifests the operation of this debilitating and morbific influence. In a word, the tubercular cachexia is developed thus:—

There is improper material taken in the stomach; enervation and emaciation ensue; the nervous system feels most sensibly the withdrawal of appropriate pabulum; a proper supply of nervous force does not reach the organs of secretion connected with the digestive apparatus; torpor is produced; a positive interruption of the process results, and a condition of disease is developed.

M. Fourcault and Dr. Beddoes think that the skin is primarily affected, and in such a manner that its functions are interfered with, whilst the lungs become secondarily involved, either through sympathy, or in an effort to eliminate the elements which should have been excreted on the surface. It is certain that impure air, &c., do produce a powerful impression on the skin, and that, in many instances, its offices are entirely suspended; but it is equally true, that the effect on the skin is one of sedation and depression—one affecting the nerves which are there distributed—and that the cause which produces an impression on a tissue whose connection with the nerves is so intimate and extended, must in that way create no inconsiderable disturbance throughout the whole nervous mass. If sedation be produced on the nerves at their extremities, the same impression will be made at their internal terminations, and of the other nerves connected with them—those which most resemble them in function, or which are more susceptible to the influence of any depressing agent, will most readily take on the same action or condition, and thus reproduce in the organs to which they are distributed, a state similar to that which exists on the surface. Thus it becomes plain, how and why an impression made on the skin can develop the tubercular cachexia in the human economy.

The last series of morbific agents to which I will refer, are those which connect themselves with the emotions. It is universally admitted, that the gratification of lust, indulgence in onanism, depression of spirits, violent grief, and, indeed, all passion whereby immediate depression or subsequent reaction is induced, tend materially to the development of the tubercular diathesis. Thus it has been established by the investigation of M. Lombard, of Geneva, that twice as many die of consumption among the destitute as among the rich and contented; and Morton[1] declares that he knows of "no cause more certain in the development of phthisis than grief, especially when it is long indulged;" and "that nearly *every case* of the disease which had come under his observation, was occasioned by mental suffering of a protracted duration." Laennec tells of a community of nuns, which, in consequence of having to submit to certain moral influences of a most terrible nature, was so victimized by consumption, that it had to renew itself three times in ten years. Hippocrates himself affirms, that "the abuse of youth by inordinate indulgence in the pleasures of love, has the most unhappy influence upon the development of consumption." Dupay[2] tells of the terrible ravages made by phthisis among the French soldiers detained at Chatham, in consequence of

[1] Treatise on Consumption.

[2] Thèse de 1847.

their distress at being confined in prison, and desire to return to their native land. Amistoy expresses himself thus: "La misère, á coup sûr, est un grande cause de débilité, et par conséquent de phthisie; mais il-y a une autre cause qui ruine encore plus promptement et plus profondement l'organisme; ce sont les passions tristes et concentrées."[1]

Wood says, that exhausting indulgences, grief, anxiety, disappointment, whether of the affections or in business, are among the predisposing causes of phthisis.

Williams enumerates among the most common causes of the constitutional origin of consumption, "depressing passions, such as disappointed love, anxiety, or distress from reverses of fortune, or other severe calamity, and venereal excesses."

I have thus been particular in bringing forward the statements of these writers, not because there can be any doubt respecting the fact to which they testify, but as a sure means of making it conspicuous and comprehensible. My object is to impress it fully on the minds of my readers, so that I may the better illustrate the truth of the conclusion which is deducible from it. Now let me ask: How do these causes operate in the production of their results? Is it through the instrumentality of the nerves, or not? Do not all mental states directly influence the nervous system? Cannot the wear and tear of the mind be detected by the destruction it occasions to the nervous tissue, and the presence of that *débris* in the excretions? These questions require an affirmative answer, or the reciprocal relations of mind and nerve is an idle fancy, the connection between cause and effect a chimera, the laws of nature uncertain in their operation, and the long established opinions of the most learned physiologists visionary and unreliable. Here, then, we have a certain effect associated with a particular cause, which, from its intrinsic nature, is exclusive in its operation, and it follows that the relation between the two is necessary and invariable. A protracted state of mental depression produces nervous sedation and debility as a matter of course, and hence they may be assumed as synonymous as far as they relate to the system at large. This is the *cause* to which I have referred above. A tubercular diathesis implies the existence of a certain impairment of the digestive process, which manifests itself by a faulty transformation of the oleaginous elements into chyle, an insufficient formation of fibrin, &c., and it is fair to consider them (that is, the internal derangement and external manifestation) as identical also. These constitute the *effects* of which I have previously spoken. A certain abnormal state of the nervous mass produces, then, that condition of the digestive apparatus which prevents the formation of a proper emulsion out of the fatty matters ingested, and in this manner it becomes apparent that the cause of consumption *must* originate in the nervous system. It is evident, that an impression made on the nerves can only affect the process of digestion, by increasing or diminishing the amount of nervous force distributed to the organs by which it is affected. If the amount be augmented, as shown by Bernard, the organs will secrete a greater quantity of the fluid appertaining to them, and the process will be more active than under ordinary circumstances; and, on the other hand, when there is a deficiency in the supply, torpor ensues, a smaller amount of fluid is poured out, and digestion is impaired. It is manifest in the tubercular cachexia, that, so far from there being activity in the process, the most unmistakable impairment and derangement exist, and the conclusion is inevitable, that the peculiar morbid pheno-

[1] Thèse, 1853.

mena to which I have alluded result from an improper supply of nervous force to the pancreas and other organs connected with the digestive apparatus.

(2.) *Special Causes.*—It is not important, in this connexion, to investigate the nature and operation of those influences which tend to develop phthisis, and for that reason I will limit myself simply to an enumeration of them. These causes may be divided into two classes also—Mediate and Immediate. (*a*) Mediate causes. These do not exercise any direct influence upon the lungs, but affect them secondarily. Thus—the constant confinement of the body to the same attitude; sedentary habits; improper clothing; suppression of habitual discharges, and all those agents which *indirectly* produce congestion of the pulmonary membrane or tissues. (*b*) Immediate causes. By these are meant all causes which directly affect the lungs, producing irritation, congestion, or inflammation in them. To this class belong those professions in which the lungs are constantly affected by the contact of irritating substances, as stone-cutting, scissor-grinding, &c.; pneumonia, bronchitis, emphysema; and everything which directs the circulating fluid immediately upon the pulmonary tissue. It will be seen, however, that this distinction is merely a nominal one, and that both classes of causes require the development of a certain amount of irritation, congestion, or inflammation of the lungs, as an essential condition to their successful operation.

In another part of this paper I mentioned the fact that tonics exercise a most beneficial influence upon this disease. I propose now to consider the nature of the action of this class of medicines, for the purpose of demonstrating still more conclusively, that the development of the tubercular diathesis depends upon some lesion of the nervous system.

It cannot be denied that tonics act directly on the nervous mass, and that their beneficial influence is owing to the effect which they produce on that particular tissue. They stimulate gently, but effectually, the nervous centres, so that an increased amount of nervous force is generated and transmitted to the various organs, and in that manner conduce to the health and harmony of the whole system. This explanation of the action of these remedies is universally admitted, and it is unnecessary to inquire further into its truth. It is well known that the mistaken opinions of Sydenham, Portal, Morton, Rush, and others,[1] respecting the essential nature of phthisis, which led to the employment of the lancet and other antiphlogistic remedies, have given place to sounder views on the subject, and that a more rational and successful treatment of the affection is pursued at the present day. Without considering it a chronic pneumonia, as taught by Broussais, or a perverted secretion, as supposed by Andral, Carswell, Forbes, and Clark, the Profession, with a singular but most fortunate unanimity, has adopted that explanation of its phenomena which attributes them to the operation of some cause that depresses the nervous system, and in that manner prevents the proper performance of the digestive functions. Constant exercise in the open air, together with the use of tonic remedies, is now recommended everywhere, as the most effectual means of relieving the peculiar morbid condition known as tubercular diathesis. Now, as no remedy can be more of a *tonic* in its influence on the system than exercise, and as the medicines selected belong to *that class* exclusively, it follows that the necessity which exists for this course of treatment, demonstrates that a condition of debility and torpor has been induced in the economy, causing the generation of a deficient supply of nervous force, and its improper conduction to the various organs.

I have thus examined at length into the circumstances which attend an

[1] Stokes still urges the antiphlogistic plan.

improper digestion of the fatty elements of the food, as it appears in connection with the tubercular cachexia, and have demonstrated that no emulsion is formed, and no assimilation takes place because of some defect in the pancreatic juice, dependent upon an improper supply of nervous force to the organ by which it is secreted. The explanations given seem to be more reasonable than those of Bennett, and I trust they will prove satisfactory to my readers.

M. Bernard has shown, by many interesting and conclusive experiments, that the liver has three most important functions—Depuration, Sanguification, and Equilibrium.

(1.) *Depuration.*—It has long been admitted that the liver, by secreting bile, assists the lungs in the elimination of carbon from the economy. This fact is substantiated by comparative anatomy, which demonstrates the antagonism of the two organs, at the different ages and the several degrees in the animal scale. Some suppose that the liver separates the bile from the blood, so that its carbonaceous elements may be burned off in the lungs; but this opinion has not stood the test of experience. Under ordinary circumstances, there are more of the carbo-hydrogenous elements formed than the lungs can burn off, as is shown by the deposition of adipose in the various tissues; and hence the existence in the economy of another organ by which this excess can be disposed of. If they were reabsorbed after being eliminated, the liver would be called upon to perform an unnecessary office in secreting them originally, and instead of being a depurative organ, it would possess features of an entirely opposite character. One of the functions of the liver evidently is, to eliminate from the system that surplus of carbon and hydrogen which is not required by the tissues or the lungs.

(2.) *Sanguification.*—In addition to this function of depuration, which has been recognized by all observers, Bernard contends that the liver has other offices. He has shown by positive experiment that this organ is instrumental in the formation both of fat and fibrin. Besides the appropriation of oleaginous material from the chyle, there is another source of fatty supply to the system. Magendie established by experiments, that whatever might be the amount of fatty material taken in the stomach, only a fixed and limited amount was acted on by the intestines, and a still smaller quantity assimilated by the various tissues. Boussingault fed ducks and pigeons exclusively on fat, and found but little more oily matter in their blood, than in that of a number of the same birds to which all food had been denied. Pusay found, in fattening geese, that the oleaginous matter formed in their bodies was more than double the amount that could be extracted from the corn consumed. These facts necessarily indicate the existence of some other means whereby fat is produced in the economy; and hence the investigation of Bernard, by which was discovered the manner of its formation. Beginning by refuting the theories by which Liebig and Chambers had attempted to account for the results of the above experiments, he demonstrated that the blood which *enters* the liver has no fat in it, whilst that in the hepatic veins *coming from* it contains oleaginous material in abundance, whether the aliment taken in the stomach possesses the fatty element or not; that "the blood in the arteries coming from the lungs through the heart, contains nearly as much fatty matter as the pulmonary arteries, and that such is the case throughout the arterial circulation; while, on the contrary, in ordinary venous blood, there can scarcely be discovered a trace of it;" and that a section of the pneumogastric nerve, or a violent impression made on the nervous system, materially interferes with the production of this material.

By a course of reasoning, and experiments precisely similar, he arrived at

the same result respecting the formation of fibrin. He found that "the blood which enters the liver, contains in large quantity the digested azotised matter, and but little fibrin, even when the animal has been fed on meat. Whereas, the blood of the hepatic veins contains much fibrin and but little of the albumen: and further, that this difference is only observed during digestion." From these facts he concluded that it is the function of the liver to produce fibrin for the blood.

(3.) *Equilibrium.*—There is a constant demand on the circulating fluid both for fat and fibrin; and hence the necessity for the continuous development of these materials. The liver thus becomes the instrument by which this equilibrium is maintained in the blood and health secured to the economy.

Now, it is evident that the performance of these various functions is essential to the health of the economy, whilst an interruption of them must produce a succession of morbid phenomena of a definite character. If depuration be not effected, the burden of combustion and elimination must be thrown upon the lungs, and a disposition to disease in that organ will manifest itself. If fat be not formed, there will be a demand made upon the tissues in which oleaginous elements have been deposited, for carbon and hydrogen, and emaciation will ensue. If fibrin be not properly generated, the tissues will not be renewed, a cachectic condition of the system will be developed, a depression of the vital powers will result, and the exudations of plasma will lose their plastic and organic character. In a word, that condition of things will present itself which is recognized as the tubercular diathesis.

In a previous article it was demonstrated, that an impression made upon the nervous system by which its generating or conducting powers are interrupted, operates in such a manner on the organs concerned in secretion, as to interfere with their normal action and to restrain or alter their natural fluids. If, then, it can be shown that the functions of an organ are interfered with, without the interposition of a local and palpable influence, it follows, necessarily, that some morbid impression has been made upon the nervous system which has operated as *the cause* in the production of these particular morbid effects. But the functions of the liver have been materially interfered[1] with, as is evinced by the symptoms which characterize the tubercular cachexia, and hence it follows that the primary lesion in phthisis consists in the existence of a condition of debility and inactivity in the nervous system. We have, then,

(1.) A condition of nervous debility.

(2.) A withdrawal of the proper nervous supply to the pancreas and liver, producing torpor in them.

(3.) An interference with the natural functions of these organs.

(4.) Emaciation, enervation, pulmonary irritability, unnatural products, and the whole train of symptoms which distinguish the consumptive diathesis.

The most important changes effected in the economy are those to which the blood is subjected, though they follow naturally from the explanations already given respecting the essential nature of this particular diathesis. As a matter of course the red globules and fibrin are diminished, whilst a relative increase takes place in the albumen.

(I.) *Organic Impression.*—When the tubercular diathesis has been developed, a morbid impression is produced upon the lungs, which renders them particularly liable to congestion and irritation. The blood no longer abounds

[1] Clark, Abernethy, Philip, Ayre, and Todd.

in rich supplies of organizable elements; the cell-germs which were once conveyed to the remote tissues, and deposited as the nucleus of a plastic structure, have been replaced by a degraded element, which inclines to exudation and is susceptible of no higher development than that which characterizes the aplastic deposit. The evil produced by the presence of such elements in the blood demands their withdrawal, and that organ in which a proclivity to irritation has been developed, and whose function is most essential to vitality and health, becomes at once the instrument by which this elimination is attempted, and the receptacle of morbid products. The lungs are susceptible to the action of the morbific agent, both from causes which are original or intrinsic, and those which are acquired—the distinguishing feature of each consisting in the fact, that it promotes either congestion or irritation of their membrane or tissue.

(1.) *Original Causes.*—The lungs are susceptible to morbific impressions for the following reasons: because of the great amount of blood circulating in them; they are constantly the seat of vital action and organic change; their lining membrane is exceedingly delicate; secretions are prone to collect in them instead of being removed.

(2.) *Acquired Causes.*[1]—In phthisis we have—1st, an interruption of the function of the skin, which throws the burden of exhalation on the lungs; 2d, a general debility, by which every tissue is weakened; 3d, excessive action in the lungs because of the improper performance of depuration elsewhere, and the manner in which combustion takes place in the other structures, &c. In this diathesis, these causes combine, and render the lung so irritable and inflammatory, that it becomes necessarily the centre of sanguineous determination and exudation. As the plasma thus poured out is deficient in healthy fibrin, and as the tissues with which it is brought in contact do not possess their normal amount of formative power, proper organization is impossible, and hence, a low, retrograde, aplastic product is developed.

§ II. I shall devote this article to a brief consideration of the views entertained at different periods respecting Phthisis, and an examination of the nature of the tubercular deposition in the Pulmonary Parenchyma. In regard to the nature of the disease, a variety of conflicting opinions have been expressed by various writers.

Hippocrates evidently knew very little about this affection, for he considered phthisis "an ulceration of the lungs, having for its essential character an abscess which produces *pus.*" Galen was no better informed, for he agreed with Hippocrates in regard to the disease and its product.

Morton says, that "in consequence of some essential depravity in the blood, there is separated from it a material of an unhealthy and unnatural character, which is *secreted* in the tissue of the lungs, and diffuses itself into the other organs."

Portal thinks, that "indurations which are the product of inflammatory action, really constitute the basis of phthisis." Baumes and Bayle describe simply a pulmonary ulceration as phthisis, and confound pus with tubercle. Langlois makes tubercle an engorgement of the lymphatic ganglions. Van Swieten and Fournet believe that they originate in extravasated blood. Laennec considers tubercle an organized body having a special existence and a peculiar character. Billings regards these products as a strumous disease of the small lymphatics of the lung, growing by the addition of lymph,

[1] See Fourcault, Williams, Beddoes, and others.

and assuming various grades of organization according to the condition of the circulating fluid. Gulliver and Vogel agree in saying, that "it is organized and contains cells, and that it spreads by its own inherent power of development." Broussais teaches that inflammation of the lung is the essential cause of the whole morbid series; whilst Hufeland and Piorry think, that though this may be the proximate cause, there is a previous condition of debility necessary to its operation. Boerhaave says, "consumption is developed with most facility where the air is damp and unfavourable to free perspiration; causing the particles which should be thrown off by that operation to collect in the system."

The most popular theories, however, are those which have been proposed by Andral, Carswell, and Williams. Andral says: "Tubercle is nothing else than the *secretion* of a matter, which seems to be produced indifferently either in the last bronchi, in the vesicles which succeed them, or in the interlobular cellular tissue. This matter, which seems to be primarily liquid, becomes solidified at a period more or less remote from that at which it was secreted, and becomes tubercle."

Carswell[1] believes "tuberculous matter to be a secretion *sui generis* as totally destitute of organization, as effete matter continuously separated from blood when that fluid is in an unhealthy state, and thrown out on the surface of mucous membranes, and producing bad consequences only in proportion as it accumulates in organs, impedes their functions, and acts on them as foreign matter."

Williams[2] refers tubercle "to a degraded condition of the nutritive material from which old textures are removed and new ones formed; and differing from plasma not so much in kind, as in degree of vitality and capacity of organization."

It is manifest, from the investigations already attempted in this paper, that the last explanation approaches nearest the correct one, for the reason that it is based upon proper views of the pathological condition characteristic of the tubercular diathesis, and is susceptible of demonstration, both by *à priori* arguments and *à posteriori* deductions. It is plain, that a peculiar irritability of the lungs must occasion inflammation in them, and that, as the plasma is deficient in healthy fibrin, and the tissues wanting in their normal formative power, the materials which should have been appropriated fail to be organized and degenerate into tuberculous matter.

Nature of Tubercle.—Bennett draws the following conclusions respecting the nature of this product:—

(1.) Tubercle consists of an animal matter mixed with certain earthy salts.

(2.) The relative proportion of these varies in different specimens.

(3.) The animal matter certainly contains a *large amount* of albumen, whilst fibrin and fat exist in very small quantity.

(4.) The earthy salts are principally of the insoluble phosphate and carbonate of lime.

(5.) Very little difference exists between the matter of tubercle and other compounds of protein.

These conclusions, especially that which refers to the animal matter contained in tubercle, follow necessarily from the explanations given of the changes which occur in tubercular cachexia, and hence, they become most convincing and unanswerable proofs of their logical truth and pathological accuracy. If the normal amount and quality of fibrin were generated, the products of

[1] Williams and Clymer on Respiratory Organs. [2] Principles of Medicine.

exudation would not only contain that substance, but would present distinct evidences of its power of organization, whether they were appropriated or not; and, on the other hand, if it were replaced by albumen[1] there would be neither appropriation nor organization, and the matter deposited would contain that principle (albumen) in excess. Tubercle contains but little fibrin, and does not organize. Its principal constituent is albumen, as shown by positive analysis; hence, the conclusion is irresistible that the blood is deficient in the one and rich in the other. If fibrin be not produced, then, the organ which generates it naturally does not act properly. But that organ, the liver, *will* perform its functions unless it be prevented by the interposition of some local cause, as congestion, irritation, &c., or the withdrawal of its normal supply of nervous force. Examinations made before and after death, conclusively demonstrate that this local impediment does not primarily exist, and it follows, both from this exclusive argument and from actual experiment on the pneumogastric nerve,[2] that the cause of the interruption is to be found in some altered condition of the nervous system. If this alteration were upwards, that is, in the direction of excitation, the organ would act more promptly and effectually; whilst if it were in the opposite direction, towards depression, torpor would result. It is evident, then, that this alteration in the system, that state which is the primary and essential lesion in the tubercular cachexia, consists in a condition of depression of absolute nervous debility, and nothing less.

Rokitansky[3] divides tubercles into three kinds: simple-fibrinous, croupo-fibrinous, and albuminous. Laennec and others describe several varieties; but it is now generally admitted that they are all different forms or conditions of the same substance. Robin declares that tubercular matter is invariably yellow; but this inquiry is not material to the subject under consideration, and consequently I shall not pursue it further.

§ III. In the first part of this paper several conditions were assumed to be essential to disease, and it now remains to be determined whether or not phthisis, as explained in the preceding pages, complies with all of them.

(1.) An altered condition of the system resulting from the action of some general cause, and favourable to the operation of some particular one, was declared to be the first step in the morbid process whereby disease is developed. I have already shown that in consequence of the effect produced by the general causes to which I have alluded, a condition of debility, of low, vital, and organic action results, in which the circulating fluid becomes vitiated, and by which the lungs are so impressed, as to become particularly susceptible to all irritating and congesting influences, whilst their formative power is materially abated.

(2.) A particular cause acting in a special manner, was the next element mentioned as necessary to disease. From the explanations given already, it is evident that phthisis is not developed until some special cause presents itself by which the pulmonary tissue is made to take in a particular inflammatory action, wherein exudation takes place, which, from the impoverishment of the circulating fluid, and the altered condition of the tissues themselves, fails to organize, and deposits itself in the form of tubercle.

(3.) Effects or symptoms were then referred to as constituting the last link in the morbid chain. In phthisis they are twofold—that is, those which

[1] "Fibrin may be considered albumen in an advanced state of development."—*Simon.*

[2] See Bernard's Experiment.

[3] Handbuch der Pathologischen Anatomie, 1846.

result from the action of the general cause, and others which are referable alone to the special cause, present themselves as concomitant phenomena. By the first, I mean those symptoms which are characteristic of the tubercular diathesis; and by the second, I refer to the effects of tubercular deposition upon the system at large.

These effects are so well understood as to render it unnecessary for me to attempt any description of them in this connection. I have thus shown that phthisis complies with the conditions essential to disease, and that in doing so it serves to substantiate the truth of the explanation given of all morbid processes.

In order to comprehend fully the deductions intended to be drawn from these conclusions it is necessary to revert to that portion of this paper in which the doctrine of antagonism was expounded and demonstrated. It was thus shown that the only sure means of altering any particular condition of the economy, was to induce a state dissimilar and antagonistic to that already existing. Effects or symptoms were declared to be the only means whereby causes make themselves known; and as the particular cause depended for its operation on the existence of a general morbid state, induced by the action of some general cause, a continuance of the same morbid phenomena indicated that no change had been effected in the original abnormal condition; and that the curative process had not been commenced; whereas a change in the phenomena, proved that the original abnormal condition had been altered, and that the succession of morbid actions was broken up. From these considerations it is evident that phthisis must be opposed by that condition which is antagonistic to it, and that the induction of phenomena dissimilar to those characteristic of this disease establishes the fact that its progress has been arrested. If it can be shown, then, that pregnancy establishes a state in the economy which is distinguished by effects directly opposed to those induced by phthisis, then it follows that the particular cause has ceased to operate—that the morbid condition by which it was favoured and permitted to affect the system has been removed, and that an antagonistic and curative impression has been made upon the economy. The object of the succeeding pages shall be to investigate the nature of pregnancy, in order to demonstrate that it is essentially antagonistic to the progress of consumption.

Chap. II. § I. *Pregnancy.*—Nothing can be more important in all its bearings than that process by which the ovum is fecundated, the uterus impregnated, and the fœtus developed. Upon its proper performance and successful issue the perpetuation of the race depends, whilst the most serious physiological changes accompany and distinguish it. The organs concerned in this important work, possess a degree of adaptation to the duties imposed upon them as extraordinary as it is complete; a delicacy of structure unsurpassed by that of any other tissue, and an intimacy of relation with the system at large as wonderful in itself as it is important in its consequences. The uterus, in the female system, is the great fountain of sensibility and sympathy. When its tissues are intact, and its functions properly performed, the highest condition of health is maintained in the economy; whilst the slightest deviation from the normal standard, either in its structure or in the manner of its action, is felt throughout the entire frame, and responded to by every organ. Hippocrates long since enunciated a truth which has been universally received: "Morborum omnium qui mulicbres vocantur uteri in causa sint;" whilst the declaration of Van Helmont, "propter solum uterum est mulier, id quod est," has passed into a physiological axiom. The actions whereby pregnancy is developed and perfected have their seat in this organ, and hence the nature of the relation

which they sustain to the organism. Their influence upon the economy is most powerful and controlling, whilst the system in turn materially affects and modifies them.

Under ordinary circumstances, each cell possesses the power of reproduction; the tissues are capable of selecting and appropriating those elements which are essential to their nutrition; and the organs have an inherent ability to perform their functions properly. When there has been no impairment of the vital principle, and the body is in a state of absolute health, these processes are performed in such a manner as to secure the most perfect equilibrium and harmony in the economy. Physiological acts, then, require this condition of things as an essential prerequisite to their proper performance, and when they are successfully executed, evidence is thereby presented of the existence of a condition in which the vital principle possesses its normal amount of activity, and the system is up to the standard of health. The uterus sustains relations of the most intimate and complicated nature with every other organ of the body. When diseased, the whole system feels the morbid impression, and presents infallible evidence of sympathy and suffering, whilst it in turn responds to the affections of other organs, and suspends its functions upon the invasion of any serious malady. If the integrity of the uterine functions be so dependent upon the healthful condition of the organism, and so indicative of the absence of serious disease, then, *a fortiori*, the perfection of its highest physiological act must require the suspension of all morbid conditions, and serve to demonstrate conclusively that they have been suppressed. Hence, the vast importance of this process, not only because of its effect upon society, but for the reason that it exercises a controlling and conservative influence upon the whole economy, whilst its successful issue demonstrates the abatement of abnormal actions and the suspension of all diseased conditions.

In treating of the nature of this great physiological process, I shall limit myself to a consideration of its effects upon the uterus itself and the system at large. One of the first evidences of pregnancy is the suspension of the menstrual flow, which results, not on account of any disease, general or special, but because the fluid is required for other purposes in the system. The symptoms which ordinarily attend the retention of this fluid, do not appear, for the reason that nature in her effort to perfect a high physiological act, gives to the system a certain tolerance or power of resistance that it does not ordinarily possess. The structure of the uterus is materially changed; its fibres are separated; numerous interspaces are left between them, and a *positive addition* is made to its substance. The cavity of the womb is materially increased in size, and filled up, not only with the fœtus itself, but with an entirely new membrane of fibrinous origin and character, rapid in its development, and important in its purposes. The vessels increase in number and capacity, which augmentation of vascular machinery implies, of course, an increase in the amount of circulating fluid in the womb. The nerves become hypertrophied from an absolute *increase of substance*, so that the sensibility of the organ is augmented, and its relations with the organism rendered more complete. In a word, it not only becomes the centre of nervous and vascular determination, but by reason of the increased vital action in it and the system at large, it acquires a principle of growth, and so increases in capacity as to accommodate itself to the important development within its cavity.

It produces in the system a condition of increased action, approaching even to plethora. This is evinced by the addition made to the vascular machinery; the augmentation of circulating fluid; the buffy coat of the blood; the unusual frequency of the pulse; the acquired tolerance of the lancet; increased susceptibility to the action of stimulants; difficulty of employing tonics to

advantage, and the proteinaceous products which are developed within the womb. The testimony of able writers may be adduced in favour of it also. "In the earlier stages of pregnancy especially, general and local plethora frequently presents itself." (Cazeaux.) "In pregnant women a physiological condition appears in which there is a positive augmentation of the mass of blood relatively to the capacity of the vessels." (Becquerel and Rodier.) "There is a tendency to the production of more blood than formerly." (Burns.)

"The general state is said to be one of plethora." (Churchill.) "The state of pregnancy is one of increased vascular action, not only in the great organ primarily affected, but generally throughout the system, by which a disposition to plethora is created." (Montgomery.)

Authorities might be multiplied indefinitely, for nearly every writer on the subject expresses the same opinion respecting the state of the system at this important period. Now, whatever may be the views of these authors, respecting the exact definition of the term plethora, there can be no doubt of the fact which they intend to assert, that a condition of excitement, of ultra health, of increased vital activity, attends and characterizes pregnancy in its development and progress.

This disposition to the establishment of inflammatory action, fevers, acute affections, &c., is so imminent as to require the production of a certain method of relief to the economy, whereby its normal condition may be secured and retained. A kind of safety valve is established through which this morbid proclivity may work itself off, without producing disease to the system. Thus, Denman has remarked, "It is a popular observation, that those women are less subject to abortion and ultimately fare better, who have such symptoms as sometimes attend pregnancy, than those who are exempt from them." Nausea, vomiting, disgust for food, &c., serve to restrain the disposition to disease characteristic of this condition, and to keep up the natural balance in the system, by lessening the quality of the circulating fluid, diverting nervous excitement, preventing plethora, and developing that state in the economy which is essential to the perfection of nature's most important work.[1]

Nothing is perhaps more indicative of the existence of this state of repletion, than the necessity which presents itself for the employment of the lancet, and the unanimity with which its advantages have been recognized by the profession. It is true that Hippocrates declares, "mulier in utero gestans, incisa vena abortit, idque magis si est fœtus auctor;" but his opinion is based upon the supposition that the suppression of the menses indicates a *necessity* for a superabundance of blood, and that its abstraction is in opposition to a law of nature. He, however, *purged* pregnant women excessively, as a means of preventing the appearance of plethora; and thus assisted in the establishment of a principle in direct opposition to that which he has enunciated in the 35th aphorism of his 5th Book.[2] Fernel was the first who dissented from the views of the sage of Cos, and bled pregnant women. He expresses himself in the following manner:[3] "Il ne sera pas hors d'apropos d'examiner si la grossesse doit être une contre indicacion a la saignée. Des considerations spécieuses appuyées sur l'avis d'Hippocrate, nous engageraient à la reserve lorsque il s'agit des femmes enceintes, même atteintes d'une maladie grave dans la vue du fœtus, qui pourrait en souffrir. Mais il n'est nullement constant de voir avorter une femme enceinte à laquelle on ouvre la veine, pas plus que de voir mourir necessairement une femme enceinte

[1] Churchill, Dewees, *et al.* [2] 1558. [3] Fernel Opera, liv. 2d.

atteinte d'une grave maladie."[1] Guillemeau, who lived towards the end of the 16th century, sustains Fernel and gives both rules and reasons for the use of the lancet in pregnancy. Mauriceau says, that in his time (17th century) nearly all pregnant women insisted on being bled at half term, and the seventh month. He makes a just criticism on the teachings of Hippocrates in the following words: "Cet aphorisme ne nous doit pas defendre l'usage de la saignée quand le cas le requiert; mais il nous fait seulement connaitre, qu'il s'en faut servir avec une grande prudence, d'autant qu'il y a telle femme qui a besoin d'être saignée trois on quatre fois, et quelquefois davantage pendant sa grossesse, et a une autre deux seulement suffisent." In the first half of the 18th century, Dionis, Puzos, and Lamotte speak of *preventive* bleedings, and recommend the employment of the lancet. Dionis thinks that a woman should be bled at four months and a half, at the seventh month, and again at the eighth month, if plethoric symptoms continue to present themselves. He gave as reasons for the employment of the lancet, the following facts: a larger amount of blood is produced than under ordinary circumstances; an unusual supply is retained in consequence of the suspension of the menses; those women who menstruate during pregnancy are healthier than those who do not; and plethoric symptoms are relieved by this remedy with facility and certainty. Puzos advocates bloodletting also, but insists that the number of bleedings requisite for the proper control of morbid symptoms, cannot be fixed upon in advance. Levret bled in the cases marked by plethoric tendencies, and recommended the lancet as an invaluable agent in the accidents incident to that particular condition. The ablest writers of the 19th century have approved and tested those principles thoroughly. Thus, Gardien, Velpeau, Dubois, Piorry, Andral, Cazeaux, Becquard, Rodier, Chailly, and many others, have arrayed themselves among the advocates of the lancet, and borne irrefragable testimony in support of its utility, propriety, and necessity, in the arrest of that plethoric condition developed by pregnancy in the female system. Denman affirms that "venesection is found useful even in those constitutions which do not ordinarily bear it well." Dr. Burns says, "it is necessary frequently to lessen plethora and local irritation by bloodletting." Dr. Dewees draws the following conclusions, after a thorough examination of the whole subject: "Women bear the loss of blood better when pregnant than at any other time. The acute diseases of pregnant women require a more extensive use of the lancet than under ordinary circumstances." But it is useless to multiply authorities, as it might be done indefinitely, for the opinions thus expressed are held by the ablest writers of all countries at the present day. From a consideration of these authorities and the facts to which they have testified, the following conclusions are inevitable:—

(1.) The utility of the lancet in pregnancy has been demonstrated.

(2.) This utility depends upon the fact that a disposition to plethora exists in connection with that condition.

It must be explained, however, in this connection, that the term plethora is not employed in the limited sense of a mere excess of red globules, as defined by Andral, but as meaning either an augmentation of the whole volume of the circulating fluid, or the increase of some one of its vitalizing elements. An examination of the blood will not only show that there has been more formed than usual, but that fibrin, its most essential principle, is largely increased. According to Becquerel and Rodier, the average proportion of red globules in man is 141 to 1000 parts of blood; and in woman

[1] See Guillemeau, 1698, p. 30, et suiv.

127. This average decreases progressively during pregnancy, not because the blood becomes impoverished, but in consequence of the great demand for fibrin, and the extraordinary production of that material.[1] During the first months, it remains at from 116 to 126; in the sixth and seventh months it averages between 100 and 120; whilst towards the close of the process it varies from 90 to 100. Albumen is about 70 in the state of health; in pregnancy it descends below 60. Fibrin is never found below the ordinary standard, but is always above it. Its average toward the end of pregnancy varies between 3.69 and 4.69, lower than in any other pathological state.[2]

Respiration is slightly increased, in the first instance, but diminishes subsequently as the uterus enlarges.[3] Thus, the process of oxidation does not take place so rapidly in that organ, and the principal burden of depuration is thrown upon the liver. The nervous system is in a state of excitement, as is shown not only by increased vital action, but by the wakefulness, watchfulness, &c., which distinguish the pregnant state.

The secreting functions participate in the general excitement, as must result from the altered condition of the nervous mass, and as is established by the *action* of the *salivary glands*, the state of the skin, &c., at this critical period of feminine existence.

Thus, from the character of the process which is accomplished during pregnancy, it is evident that the absence or subsidence of all organic disease is demanded by nature, for the perfection of her most important work; whilst an examination of the changes of the uterus itself, and the organism at large, clearly demonstrates the establishment of a condition of increased nervous energy, of extraordinary vital action, and of ultra health.

§ 2.—Having considered the nature of phthisis, together with its effect upon the economy, and discussed the changes which accompany and distinguish pregnancy, I shall now attempt to contrast the two, for the purpose of showing the antagonism between them.

(1.) Phthisis has two stages, the first marked by those symptoms which distinguish the tubercular diathesis; the second characterized by the deposition of tuberculous matter in the lungs. Both are essentially morbid, depending upon positive nervous debility, marked by low vital action, and attended with distinct organic changes, of a low asthenic nature, throughout the entire system.

Pregnancy implies the existence of a physiological process in the economy, having for its prerequisite a certain amount of health, demanding the arrest of organic lesions as an essential condition to its progress and perfection, and producing a state of repletion, in which the vital principle attains its full maximum of development, and the system is predisposed to the highest grades of action.

(2.) Phthisis is distinguished by the presence of *feeble and flabby muscles*,[4] loss of strength, emaciation of person, and anemic appearance.

Pregnancy is marked by the extraordinary enlargement of the uterus, which is *composed chiefly of muscular* tissue, increase of strength, rotundity of person, and plethoric appearance.

(3.) Phthisis is preceded and accompanied by a positive impairment of the digestive process; a condition in which the nutritious elements of food are improperly prepared for the use of the economy; a state which precludes assimilation, both because of a defect in the pabulum supplied, and a diminution of the formative power of the tissues. Pregnancy is frequently attended

[1] Simon, Regnault. [2] Andral and Gavarret. [3] Rokitansky. [4] Aretæus.

with an *interruption* of the process of digestion, resulting, not from any inability of the parts concerned to perform their natural functions in its accomplishment—not because nutritive elements are deficient or defective—not for the reason that the tissues cannot appropriate the organizable elements upon which they live, but in consequence of some disturbance of nervous energy, or in obedience to that instinctive sympathy which teaches particular organs to respond to the necessities of the organism.

(4.) Phthisis has among its essential elements an alteration in the components of the circulating fluid. Albumen is defective and superabundant; red globules are not produced in their normal quantity, and fibrin loses its powers of organization, and is materially diminished in quantity. As a consequence of these changes, extravasations occur readily, neither organization nor appropriation takes place, and depositions are made throughout the system, amorphous in their character, albuminous in composition, and distinctive in their effects upon the economy.

Pregnancy also produces alterations in the blood, but they differ materially from the above. Albumen remains fixed; red globules diminish in quantity in consequence of the great demand for fibrin; and fibrin increases up to the highest possible ratio. The result of this change is manifested in the products of the uterus; for there is not only developed within its cavity a fœtus, consisting principally of proteinaceous elements, but membranes, blood-vessels, and nerves, which are essentially fibrinous in their origin and constituents; all of which are the direct consequences of a high physiological act, and subservient to the most important purposes known to the economy.

(5.) In phthisis the great burden of combustion and depuration falls on the lungs; the balance maintained between them and the liver is destroyed, and the hepatic functions materially interfered with. The pancreas, salivary apparatus, skin, and secerning functions generally, are rendered torpid or irregular, whilst the fluids peculiar to the various organs are altered in quantity and quality.

In pregnancy the balance is disturbed, but the burden falls on the liver.[1] The cavity of the thorax diminishes in capacity as the fœtus is developed, so that the lungs have less work to perform, which of course imposes the labour of depuration on those organs that have a corresponding function. The skin, also, for this reason, excretes with unusual rapidity, and lends a powerful assistance towards maintaining that equilibrium which is essential to health. The pancreas indicates no debility or derangement, but secrete properly that fluid whereby oleaginous elements are prepared for assimilation. The *salivary organs* are particularly active, as has been remarked by all writers on this subject. Thus, it becomes evident that the state of pregnancy is characterized, not by torpor of the organs and deficiency of the fluids, but by a state of great functional activity throughout the whole system.

(6.) In phthisis, a state of absolute depression or debility manifests itself in the entire nervous mass, so that the normal amount of nervous influence is neither generated in the centres nor transmitted to the organs.

In pregnancy there is a condition of exaltation, of excitement, of unusual action, developed in the nervous system, as is shown by the restlessness, irritability, reciprocal sympathy, and activity of function which attend its progress. Nervous tissue even becomes hypertrophied from excessive health, for the nerves of the uterus are not only found more sensitive, but positively enlarged during the continuance of the state of gestation.

(7.) In phthisis, tonics and stimulants, both local and general, are par-

[1] Rokitansky, Montgomery, Burns, and Chailly.

ticularly *indicated*, whilst the employment of depleting measures is not only uncalled for, but positively dangerous to the patient.

In pregnancy, tonics and stimulants are contra-*indicated*, for they serve but to increase the tendency to plethora therein developed. Antiphlogistic measures, on the contrary, are rendered necessary by this state of general repletion, and play a most important part in the subjugation of all those morbid affections to which women are liable during the progress of fœtal development. In a word, an examination of phthisis and pregnancy clearly demonstrates that they are essentially different and antagonistic, both as regards their intrinsic character, the manner of their development, and the nature of the results which they produce in the economy. If, then, the doctrines of Hahnemann be true, the coexistence of these two opposite conditions is possible, and the progress of phthisis will not be restrained by the development of pregnancy. But, on the other hand, if the principle of "antagonism" already illustrated constitute, in fact, the great basis of therapeutical action, the existence of pregnancy must operate as a restraint upon the continuance of the tubercular diathesis.

It is hardly necessary to assert, in this connection, that phthisis does materially interfere with those processes whereby pregnancy is developed, for it is well known that morbid conditions cannot favour the consummation of a purely physiological act, and that a suppression of the menses is one of the earliest and most constant symptoms of the tubercular cachexia. Of course, it is far easier for a woman to become pregnant, when thus affected, than for phthisis to originate and progress during the continuance of the state of gestation, for the obvious reason that health is the *normal state* to which there is always a natural proclivity; and that Providence invariably manifests wonderful wisdom and foresight in dealing with final causes. Here, then, are two states sustaining certain reciprocal relations, which render them mutually dependent upon each other. One, by reason of the characters upon which these relations are based, serves as a check upon the other. What, then, must be the nature of the influence exerted in return? It must evidently be, one of control, of opposition, of restraint. The *second* must affect the *first*, just as the *first* affects the *second*, and it is proper to conclude that pregnancy retards the development of tubercles in the lungs.

Phthisis makes itself known by a set of phenomena of a particular character. Pregnancy is distinguished by phenomena entirely dissimilar and antagonistic. Their coexistence implies the continuance of two opposite conditions in the economy, and involves nature in the contradiction of perfecting antagonistic processes,[1] each affecting the system in all its parts and powers, at the same time and under identical circumstances. The natural antagonism between health and disease—between a state purely *physiological* and one essentially *pathological*, is sufficient in itself to account for the restraining influences which are reciprocally exerted by those two conditions; and thus for a double reason the antagonism between phthisis and pregnancy is rendered clear and palpable.

CHAP. III. § I. In speaking of the special causes whereby the deposition of tubercles is effected, I mentioned that their potency depends upon a certain capability of producing irritation or congestion in the tissue of the lungs. So manifest is the fact, that the appearance of tubercles in the lungs is preceded by some irritation of their structure, that many accurate observers have main-

[1] See St. Hilaire, Meckel, Rudolphi, Serres and Vernois.

tained that phthisis originates exclusively in such a condition. Laennec has exploded this idea in a masterly manner, whilst Louis, Andral, and Grisolle have sustained his position by an array of facts and argument perfectly satisfactory and overwhelming. That irritation, congestion, &c., do play an important part in the development of phthisis, can be easily established, both by a reference to authorities, and an examination of the phenomena connected with that disease.

Wood declares: "Anything which is capable of irritating or inflaming the lungs; of producing an unusual influx of blood; or an unusual secretory effort, acts as an exciting cause to the deposition of tubercles in those predisposed to them."

Laennec says: "Although inflammation cannot by itself produce tubercles, it may *hasten* their appearance, in the same way as a soil well tilled after a long fallow, or left fallow after several years' culture, will cause many seeds to germinate which had lain within it in a state of inactivity for several years."

Cruveilhier gives the following experiment: "I injected through an opening made in the trachea of a dog, two ounces of mercury, the greater part of which was rejected by coughing. The dog, however, did become apparently phthisical, and did emaciate. At the end of two months the lungs were crammed with tubercles, both isolated and agglomerated."

Jackson affirms, "that the most usual exciting causes of pulmonary tubercles are, neglected catarrhs, and pneumonias of a feeble grade."

Bayle even declares, "that pleurisy, pneumonia, exanthematous diseases, &c., are sometimes the cause of phthisis, but for the most part, they only hasten its advent."

Morten says, "Et equidem non dubito quin in herpes morbi primordiis catarrhi, tussesque communis frequenter in phthisim pulmonarem degenerare soleant."

Hufeland believes that, "more than half of consumptions are the results of catarrhs."

Van Swieten affirms that, "pulmonary congestion is the principal cause of the development of phthisis."

Baron and Fournet have maintained the same opinion, whilst Andral admits that "hæmoptysis is in many instances the first step towards tubercular deposition, as well as the sure evidence of the local implication."

Stokes and Clark affirm, "that some congestion of the lungs always precedes the development of tubercles."

It is well known that those influences which interfere with the functions of the skin, and thus give a centripetal direction to the current of the blood, operate powerfully in developing the disease. A phthisical predisposition is also particularly characteristic of puberty, for the reason, that there is a concentration of nervous and vascular energy upon the lungs at that period.

The invasion of consumption is also especially favoured by those occupations in which pulmonary irritation is constantly developed. Thus, stone-cutters, scissor-grinders, &c., are particularly liable to phthisis.[1]

Lieutaud and Portal furnish instances in which phthisis resulted from the irritation occasioned by continued fever.

Amestoy gives the case of a man who foolishly attempted to swallow a nail, which unluckily fell first into the trachea, and then lodged in one of the bronchi. This produced an irritation of the parts which resulted in death.

[1] See Reports of Lombard, Dumeril, and Benoiston de Chateau-neuf. Archives Générales, 1830.

A *post-mortem* examination revealed the fact, that the lungs had been filled with tubercles.

Louis tells of a young butcher who received a violent blow on the chest, and died of consumption in a very short time. From a consideration of these facts it is evident, that in addition to the general predisposition to phthisis, a certain amount of local irritation or congestion is necessary to the completion of the morbid series which constitutes the disease.

Whatever, then, operates in such a manner as to prevent or relieve that irritation, and to render the lungs less susceptible to the causes which produce it, must exercise a most healthful influence upon those predisposed to phthisis, and resist the onward march of the disease, even when its particular diathesis has been established.

§ II. I shall endeavour to prove that pregnancy necessarily opposes this sanguineous determination to the lungs, and resists the establishment of that irritation upon which the development of tubercles depends.

(1.) The great principle of derivation and revulsion is universally appreciated by medical men, and constantly invoked in the treatment of disease. Derivation, in a therapeutical point of view, signifies that action by which the circulating current and nervous energy are drawn towards a particular point, as a means of diverting them from a part in which they are producing morbid accidents. According to Nysten, it is "an artificial excitation designed to break up a tendency which manifests itself in the fluids and forces to concentrate themselves wherever a centre of irritation exists."[1]

In the human system there is only a certain capacity of nervous action and a definite amount of blood.[2] Whenever there is a nervous or sanguineous concentration upon one point, there must necessarily be a deficiency elsewhere, and hence, the philosophy and importance of the principle of derivation in the treatment of disease.

The value of revulsion in the arrest of phthisis, can be made evident by a reference to a few acknowledged facts.

The use of blisters, setons, issues, &c., has been resorted to from the earliest times, and has been found of extreme importance in the management of consumption. Exercise, by giving a centrifugal direction to the circulating current, and by stimulating the skin, &c., to proper action, frequently produces a most happy result upon the progress of that disease. Intermittent fever[3] exercises a controlling influence upon phthisis. Fistula in ano connects itself in a special manner with phthisis, and frequently retards its march, and prevents the deposition of tubercles.

Emetics have been employed in the treatment of consumption from a very early period. Many able writers maintain that the most effectual method of relieving the morbid state upon which the development of tubercles depends, is to be found in the free use of emetics. Morton particularly recommends them, and he is sustained by Robinson, Reid, Dumas, Holland, and Carswell, all able writers and eminent pathologists. Giovanni di Vittis has given this class of remedies a most thorough trial, and is convinced of their great utility, especially in the early stages of phthisis. Piorry, Bouillaud, Trousseau, Valleix, Louis, Andral, Rogie, Lisfranc, and many others, have tested the merits of

[1] "Fluentium humorem revulsio me dela est derivatio autem eorum qua jam obsiderant membrum."—GALEN.

[2] Holland's notes. Tweedie's Practical Medicine.

[3] See Mémoire de M. Carriere, Bulletin de l'Académie de Médecine, 1844–5. Mémoire par M. Lefevre, Bulletin de l'Académie, p. 968, vol. x. &c.

this plan of treatment, and testified to its efficacy in preventing the deposition of tubercles, and arresting the march of that cachexia which precedes and produces their development in the pulmonary tissue.

These facts clearly establish that consumption may be arrested before it is fully developed or perfected by the deposition of tubercles; and it follows as a necessary deduction, that when it can be established that a particular process diverts the fluids and forces of the system towards another organ, it is fair to attribute to that process certain curative powers and preventive influences in connection with the progress of the tubercular cachexia.

(2.) As soon as impregnation is effected, the uterus and its appendages become the seat of most important physiological actions and organic changes. Under the influence of the process thus established, these parts are made centres of nervous and sanguineous determination, to an extent that can only be comprehended by a consideration of the wonderful results which are there accomplished. The development of the fœtus; the elaboration of organized membranes; the increase in the vascular apparatus of the organ; the formation and hypertrophy of the nervous filaments distributed to its tissues; and the perfection, in fact, of nature's highest and most complicated physiological work, demonstrates the necessity for the presence of a full tide of blood and nervous energy in the parts concerned in this important process, and proves that such a concentration has been effected. As a necessary consequence the whole system feels the effect of this derivation; and the lungs, in common with all other organs, are relieved both from the predisposition to irritation and the congestion which has been effected in them. Thus it becomes evident that the arrest of phthisis in those predisposed to it—that is, before the disease has been confirmed by the development of pulmonary irritation, &c., and the deposition of tubercular matter—is in direct conformity with an established law of nature, and that a denial of the fact involves the plainest principles of therapeutics in an interminable labyrinth of contradictions.

§ III.—But pregnancy is not only opposed *per se* to the continuance of the tubercular diathesis, as has been shown above; it operates also by means of its secondary effects—if such an expression may be employed—in the arrest and removal of this particular cachexy.[1] Thus by diminishing the cavity of the chest, it exposes a smaller quantity of pulmonary membrane to the influence of external causes, and renders the lungs less liable to disease of an inflammable character; whilst by the pressure of the gravid uterus against the liver, stomach, pancreas, &c., it stimulates these organs to increased action, and gives additional relief to the one already suffering.

Again—some of the means whereby nature relieves herself from morbid predisposition,[2] serve in a most effectual manner to remove pulmonary irritation, and even to produce the discharge of abnormal products after they have accumulated in the lungs.[3] It is well known that one of the most frequent symptoms which presents itself in connection with pregnancy, is excessive nausea and vomiting. Now, as I have shown before, emetics are of great benefit in the tubercular cachexia, for the reason "that they prevent the development of pulmonary irritation,[4] and remove both congestion and unnatural products from the air-passages and the subjacent vesicles." It is manifest that the vomiting which connects itself with pregnancy, must operate in the same manner, and thus another excellent reason is furnished for the arrest of tubercular deposition in those predisposed to phthisis, by the development of

[1] Rokitansky. Manual of Morbid Anatomy.
[2] Denman.
[3] Carswell.
[4] Holland's Notes.

that particular symptom. It is possible also, that hæmorrhoids, which are frequently produced by pregnancy, may serve as a centre of irritation and a source of relief, in the same manner as fistula in ano usually does, and that in this way some retardation of the progress of phthisis may be effected.

Holland, in his *Medical Notes*, affirms, that nothing exercises a more potent influence upon the development or prevention of disease than the concentration of the attention upon any particular organ. This must be admitted by every careful observer of morbid actions, and is received as a truism by the profession. What can give more fixedness and concentration of attention than the expectation of being impregnated, the assurance that pregnancy has been established, and the certainty of becoming a mother? With what constant watchfulness must that woman regard her womb, who perceives that her menses have been arrested, that her abdomen is enlarging, and that a child is developing itself within her bosom? And if it be possible for disease to be removed from an organ, and for the nervous influence and sanguineous current to be directed upon another by any mental effort, under what circumstances could it be so well accomplished as when the uterus is engaged in the act of reproduction, and employed with all the changes, alterations, and labours incident to that important process? Here, then, is another reason for attributing to pregnancy the power of arresting the progress of tubercular deposition.

The object of pregnancy is to reproduce the species and perpetuate the race. Like all other physiological acts, it requires certain conditions for its perfection, which nature labours to supply with a generous and intelligent hand. Health is essential to the proper performance of all vital actions, and the amount of health demanded is always in direct proportion to the importance of the physiological process. Pregnancy implies the existence and progress of the most important process known to the economy. Its successful accomplishment requires, consequently, the maximum development of vital power, and the nearest approach to the normal standard of which the organism is capable; and hence, its proper performance is an evidence of the abatement of all serious morbid action, and the establishment of a condition essentially antagonistic to the invasion and progress of disease. This statement is verified by the following facts:—

(1.) Most women increase both in size and strength during the period of gestation.

(2.) Women who bear children habitually enjoy better health than those who do not.

(3.) Pregnant women are less susceptible to the influence of contagious diseases, epidemics, &c., than others who are in a normal condition, as has been affirmed by Bayle, Andral, Montgomery, Ashwell, Sydenham, and many others.

Thus it is evident that nature attempts to throw safeguards around this important process by inducing that condition most essential to its success, and by arresting every action calculated either to interfere with its progress or to prevent its consummation. From these considerations it is plain, that pregnancy must tend to prevent the progress of consumption with those in whom the tubercular diathesis has been established.

CHAP. IV. § I. As I have thus attempted to establish by facts and arguments that pregnancy arrests the development of tubercles, I shall now endeavour to sustain that position by a reference to authorities.

"Dès qu une femme est grosse, les probabilities de sa vie augment."—*Gardien.*

"Where women who have been labouring under certain forms of disease happen to conceive, the morbid affection previously existing is oftentimes checked or even altogether suspended for a time, as has been frequently observed of persons affected with phthisis."—*Montgomery.*

"In a great majority of cases the symptoms of phthisis are suspended, or at least remain stationary during pregnancy."—*Andral.*

"It is a remarkable circumstance that pulmonary consumption is very generally suspended in its progress by pregnancy."—*Eberle.*

"During the progress of pregnancy consumption seems to be suspended."—*Heberden.*

"Des deux femmes phthisique au même dégré celle qui dévient enceinte, arrive surement au terme de la gestatione; tandisque l'autre périra avant le temps."—*Rozier de la Chassagne.*

"Phthisis pulmonalis frequently becomes modified during pregnancy, and is succeeded apparently by perfect health."—*Chailly.*

"A very salutary change is effected in the whole system, so that persons enjoy better health during pregnancy than at any other time."—*Burns.*

"The effect of disease seems also, in many cases, to be suspended during pregnancy. I do not recollect a single instance of any consumptive woman being unequal to her delivery, or having her fate hastened by it."—*Denman.*

"In females affected with pulmonary phthisis which has not reached the hectic stage, pregnancy goes on well to the full term. The progress of phthisis is often modified, and sometimes really arrested."—*Jacquemier.*

"You can understand, too, why this morbid nutritive activity, this disposition to deposit albuminous matter, should be shown in woman after the completion of utero-gestation, and in persons on the speedy healing of large suppurating wounds; circumstances which, as they continue, are known often to suspend the progress of consumptive disease."—*Williams.*

"Pregnancy cures hæmoptysis and hemorrhages distant from the uterus; chronic diseases are rendered slow in their progress, and some are cured; whilst a temporary benefit is experienced in phthisis."—*Nauche.*

"I cannot conclude better, than by a quotation illustrative of the effects of pregnancy upon existing diseases, with which, I may add, my own experience perfectly agrees. 'We have sufficient evidence to justify the belief, that pregnancy acts in a great degree as a protective against the reception of disease, and apparently on the common principle, that during the continuance of any one active operation in the system, it is thereby rendered less liable to be invaded or acted on by another; thus it has been observed, that during epidemics of different kinds, a much smaller proportion of pregnant women have been attacked than others; and when women who have been labouring under certain forms of disease happen to conceive, the morbid affection previously existing is either greatly checked, mitigated, or even altogether suspended.'"—*Churchill.*

"Nature assumes her rights, and combats every disease while this important process (pregnancy) is going on."—*Parr.*

"The fact that pregnancy not only checks the advance of existing tuberculosis, but also excludes its development, may be thus explained. As the abdomen enlarges, the thoracic cavity becomes encroached upon, and, the parenchyma of the lungs being exposed to pressure, a condition of venosity results. This is doubtless the reason why the fœtus is scarcely ever, and the placenta very rarely, tuberculous."—*Rokitansky.*

"They (consumptions) are often checked by the return of mild weather, but perhaps even in a still more remarkable manner by pregnancy."—*Gregory.*

"That pregnancy has almost an invariable tendency to suspend phthisis, is notorious. This I have known very strikingly illustrated in several cases, in which every symptom of pectoral affection ceased during the period of gestation."—*Chapman.*

"Nature, attentive to her work, seems to forget everything to carry it to perfection. The progress of fatal diseases is retarded, and pregnant women labouring under phthisis, who, in the usual course of that complaint, would soon perish, go through the regular period of utero-gestation."—*Richerand.*

"The symptoms of consumption are generally arrested, or at least greatly mitigated, during pregnancy."—*Morton.*

"Tubercular disease is rendered latent, or at least masked, by a peculiar condition of the system, or by the presence of other diseases. Pregnancy appears to retard, if not to suspend, its progress."—*Clark.*

"The arrest of phthisis is owing to that powerful excitement which the uterus receives at this critical and important period, by which the irritative pulmonary actions are subdued, and the impetus of vascular action directed into another course."—*Reid.*

This opinion numbers also amongst its supporters, Baumer, J. Frank, Bordeau, Portal, Dugès, Sydenham, Good, and many others of equal merit and respectability; and, in fact, has been almost universally accepted by medical men, from the days of Hippocrates down to the present time.

§ II. M. Dubreuilh[1] presented a communication to the French Academy in 1852, which utterly rejects the doctrine of antagonism between pregnancy and phthisis, and attempts to establish that the progress of tubercular development is really hastened by that particular condition. M. Grisolle,[2] who was appointed to report on the subject, fully sustains these conclusions, and adduces additional arguments in support of them. Neither of them, however, has examined the physiological questions involved in the inquiry, whilst both base their objections to the established doctrine on the subject upon the observation of a comparatively small number of cases of *well-developed phthisis* which have been brought within the pale of their experience. It is true that they appeal to Louis,[3] and invoke his experience and teachings in support of their positions; and, by a species of special pleading, succeed in making a very good case for themselves. They can, however, be easily met and answered, as I shall demonstrate in a few words.

1. Even if their conclusions are correct, nothing is established in opposition to the views presented in this paper. My object has been to show that pregnancy *prevents the development* of tubercles in those *predisposed to phthisis*, whilst they have laboured to prove that it does not ARREST phthisis itself, *when actually established.* It is certainly true that I have adduced facts, arguments, and authorities in support of the power of pregnancy to retard or prevent the progress of phthisis proper, but it has been done with especial reference to the establishment of an antagonism between that condition and the actual deposition of tuberculous matter, when only the tubercular cachexia exists. I have intended to show that if pregnancy mitigates, conceals, and actually arrests consumption when fairly developed, then, *à fortiori*, it must retard the deposition of tubercles in those *predisposed* to phthisis. This is the point at issue; and as the deductions of these gentlemen do not affect it in the slightest particular, the conclusion is inevitable that they have established nothing in opposition to the position assumed in this paper. I have shown that the *spark* may be extinguished by certain means; they attempt to prove that these means do not arrest the *flame;* so that the question which I have endeavoured to solve is not in the least degree decided by their investigations.

2. They have not established their position. The thirty-five instances to which they have referred, in support of their views, prove nothing when compared with the thousands of cases upon which the opinions of so many writers have been based. The authorities which maintain the existence of this "antagonism" are far more numerous than the cases collected and reported by these learned Frenchmen; and thus it becomes evident that they have done nothing towards the overthrow of this long-established and most logical hypothesis.

[1] Mémoire par Charles Dubreuilh, Bul. Académie de Médecine.
[2] Bul. de l'Académie de Médecine, tom. xvii. p. 14.
[3] Louis gives no positive opinion on the subject, and says he has not formed one.

When they have proved that pregnancy and phthisis develop conditions which are identical in their nature and similar in their results upon the system at large; when they have reconciled their necessary contradictions and peculiar antagonism, and established that an act purely vital and a process essentially morbid require like conditions for their perfection, the same laws for their government, and reciprocal support for their very existence, then will they have done something towards the overthrow of principles which the common experience of professional men proclaims to be true, and the establishment of more enlightened and logical doctrines of medical philosophy. To those acquainted with French hospitals, it will hardly be necessary to say that thirty-five cases selected from their wards, for the purpose of sustaining a foregone conclusion, do not furnish a sufficient basis for the foundation of opinions which are to establish a new principle in regard to a matter of the first importance to the medical world.

It may be urged that the fact of the development of various morbid symptoms in connection with pregnancy is an evidence that it may be perfected in conditions opposed to the normal state. To this I will answer, *first*, that these symptoms do not indicate the existence of any serious organic change, but, on the other hand, they establish the excessive development of the vital principle, and show that the peculiar state which is most antagonistic to tubercular progress has been produced to an extent that requires the intervention of nature to restrain it within proper limits; and, *secondly*, that they do not possess any morbid character when compared with that condition which, in the wisdom of Providence, they are designed to relieve.

Again, to suppose that a physiological process and a pathological action require the same conditions for their consummation, and similar laws for their government, is to convict nature of a contradiction which compromises both the wisdom and goodness of its author, whilst it precludes the study of natural phenomena upon rational principles, and prevents all advancement in the science of medicine. The universal law[1] that "nature is infallible, incapable of contradictions, and has but one plan in her views of organization," has long furnished the light by which scientific men have conducted their investigations, and supplied the only certain guide in the attainment of truth. The antagonism between pregnancy and phthisis demands, then, the suspension or arrest of this disease when the state of gestation is developed.

§ III. It may be affirmed that the proportion of females who die of consumption is greater than that of men, and that there can be no great conservative influence which operates for their protection. There is, however, no positive evidence of this fact; and, even if it were true, it would prove nothing in opposition to my hypothesis. It is true that Louis, Laennec, Papavoine, and Andral agree that a majority of phthisical cases occur among females, yet Bayle, Clark, and others have doubted the truth of their conclusions, and furnished statistics in contradiction of them. The following table is given by Clark:—

At Hamburg,	out of	1,000	cases,	555	were males,	and	445 females.
" Rouen,	"	100	"	56	"	"	44 "
" Naples,	"	697	"	382	"	"	315 "
" New York,	"	2,954	"	1,584	"	"	1,370 "
" Genoa,	"	133	"	71	"	"	62 "
" Berlin,	"	620	"	328	"	"	292 "
" Sweden,	"	3,948	"	2,088	"	"	1,860 "
" "	"	6,157	"	3,054	"	"	3,103 "
" Stuttgard,	"	500	"	256	"	"	147 "

[1] Geoffroy St. Hilaire.

Dr. Duncan shows from the Registrar's Report, the following facts: Out of 10,000 of the population of London, 828 died of consumption, of whom 457 were males and 371 females, and of the 936 who fell victims to phthisis in Birmingham, 526 were men and 410 women.

From these tables it is evident that the question of relative mortality is by no means a fixed one, and that there are good reasons for doubting the conclusions of Louis and Laennec in regard to the subject. In many thousands of instances at least, a great protecting principle has manifested itself in connection with the female system, and it is evident that without some such conservative influence the number of women who die of consumption would far exceed that of men, for the reason that their physical conformation, mental qualities, moral character, and natural habits, render them particularly susceptible to the action of those causes whereby phthisis is produced. That this immunity and protection are due to the effects of utero-gestation is evident from the following considerations:—

(1.) Pregnancy, as shown before, produces a condition of antagonism in the economy.

(2.) Pregnancy is a vital process, a high physiological act, and hence its existence is incompatible with the progress and perfection of a purely morbid effort.

(3.) Pregnancy diverts the forces and fluids *from* the lungs, and *to* the uterus.

(4.) Pregnancy is regarded by a large majority of medical men, as antagonistic to the march of consumption.

(5.) Pregnancy depends upon the existence of certain susceptibilities which are inherent in the female system, and hence it is more *universal* in its operation than any other imaginable cause.

(6.) Pregnancy, coition, &c., are particularly desired by women affected with phthisis, which constitutes a *pointing* of *nature* towards a *remedy* for the evils by which the system has been invaded.

But even if more women than men die of consumption, it establishes nothing in conflict with the position assumed in this paper.

If the natural predisposition of the two sexes were the same, and the influences around them identical, then the fact of a greater mortality among women would demand the interposition of some general cause in the production of the unequal result, and pregnancy might be assumed as that cause, both for the reason that it connects itself with the organ which has the most important part to play in the female system, and because of the *universality* of its operations. But it is entirely unnecessary to introduce any such influence for the purpose of explaining the inequality of men and women in regard to the effects of phthisis. It can be explained by a reference to the natural differences between the sexes, without searching for other causes than those which necessarily connect themselves with the progress of the disease.

Woman is naturally more delicate than man, whilst her natural susceptibilities to morbific agents are increased by her education, her passions, and her peculiar habits of life. For these reasons, consumption develops itself with more facility in their systems than in those of men, and hence, the fact of their greater mortality can be accounted for, without attributing to pregnancy any agency in effecting it. Thus, it becomes evident that though a greater ratio of women may fall victims to phthisis, pregnancy cannot occasion the difference; and as a consequence, it follows that the statements of Louis and Laennec do not contradict the assertions of this paper.

Besides this negative argument, another of a more positive character may be drawn from these considerations.

There is a natural inequality in the relations which the two sexes sustain to phthisis, dependent upon differences of conformation and character—*plain, palpable,* and *conspicuous.* An examination of phthisical statistics should show, then, a decided preponderance of female victims; it should demonstrate that the difference between the number of women who die of consumption and the number of males attacked, is as great as their dissimilarity of original predisposition. The fact that a larger proportion of females fall victims to phthisis, should be as *plain, palpable,* and *conspicuous,* as that they are more susceptible to those influences which produce the disease. But, as has been shown above, in a large number of instances the statistics of tubercular affections prove, that, notwithstanding the original predisposition of women, and their greater susceptibility to the influences whereby phthisis is developed, the proportion of victims among males is greater than among females; and even if these tables do not establish the rule in this matter, they certainly demonstrate, that so far from its being a fact, *plain, palpable,* and *conspicuous,* that more women die of consumption than men, the whole subject is so involved in doubt and obscurity as to justify the most contradictory opinions, and to demand much careful attention and patient research for its proper elucidation.

Some agent, then, most potent in its influence, and universal in its operation, interposes itself for the purpose of equalizing the account between the two sexes, and making up for their natural differences in this particular. Pregnancy, as shown above, most completely fulfils all the conditions involved in the existence and operation of such an influence, and hence, it is proper to conclude, that it is the equalizing cause to which this result is attributable. I will state the argument more clearly:—

(1.) There is an inequality in the relations which men and women sustain to phthisis; the former being less liable to it than the latter.

(2.) This inequality depends upon certain differences of conformation, &c., which are *plain, palpable,* and *conspicuous.*

(3.) An examination of phthisical statistics should show that more women fall victims than men, and that the difference in the relative mortality of the two is as *plain, palpable,* and *conspicuous,* as their original dissimilarity of constitution and predisposition.

(4.) An examination of statistics proves, that *it is not* a settled *fact* that more females are destroyed by this malady, and that there is a positive approximation towards *equality* in the effects of phthisis upon the two sexes.

(5.) This "approximation towards equality" shows the operation of some great equalizing cause, by which a certain amount of protection is secured to the female system, that makes up for its greater original susceptibility, and affects the general result in the manner alluded to above.

(6.) Pregnancy complies with *all* the conditions which this cause demands for its operation, and it is fair to attribute this protecting, preventing, and equalizing effect to its influence upon the female system.

I have thus attempted, by arguments, facts, and authorities, to prove—that pregnancy prevents the progress of phthisis, even when that disease is perfectly developed. Whether this effort has been successful, or not, must be left to the judgment of my readers; and to them I confide my cause, with the full assurance, not only that their decision will be equitable in regard to all that has been urged in support of my position, but that they will agree with me in the conclusion that, if pregnancy can arrest the progress of consumption when fully established, then, for a still *stronger reason* must it "retard the development of tubercles in those predisposed to phthisis."